



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|------------------------------|------------------|
| 10/721,484 | 11/25/2003 | Joseph D. Guthrie | 01-0942 ESCM 370109-00004 | 5979 |
| 8840 | 7590 | 08/30/2006 | EXAMINER | |
| INTELLECTUAL PROPERTY ALCOA TECHNICAL CENTER, BUILDING C 100 TECHNICAL DRIVE ALCOA CENTER, PA 15069-0001 | | | SELLMAN, CACHET I | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1762 | |

DATE MAILED: 08/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/721,484

Applicant(s)

GUTHRIE ET AL.

Examiner

Cachet I. Sellman

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 17 and 18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 19-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/2/2006 has been entered.

Claim Objections

2. Claim 10 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 10 has the limitation that the step of irradiating is carried out for a sufficient time to embrittle the polymer in the coating; this limitation is also in claim 1 from which claim 10 depends therefore claim 10 does not further limit claim 1.

Double Patenting

3. Claim 19 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 1. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Response to Arguments

1. Applicant's arguments filed 8/2/2006 have been fully considered but they are not persuasive. In response to applicants arguments that irradiating the crosslinked layer will not inherently result in chain scissioning because the chain scissioning depends on more than dosage but exposure time as well as composition. However, the examiner will hold the rejection that was made because the prior art teaches the use of the same polymers as the applicant uses in the process and the prior art teaches curing a thermoplastic layer then irradiating the layer again with electron beams with a dosage that is within the range of the applicant's and for further support that by curing the thermoplastic then irradiating the layer again with electron beams will result in chain scission Walton et al. (US 5595705) teaches a process of irradiating a thermoplastic film to crosslink the film using an irradiation dosage of up to 20Mrad. Walton et al. further teaches that films made from linear polymers exhibit improved physical properties due to a degree of chain scission as a required of irradiation treatment. Walton et al. proves that irradiating an already cured (polymerized) polymer will result in chain scissioning. Therefore the examiner maintains the rejection made that by curing the thermoplastic layer then irradiating the layer with electron beams that chain scissioning will inherently occur as further taught by Walton et al.

2. In response to the applicant's arguments that chain scissioning does not inherently cause embrittlement. The examiner cites Ahlqvist et al. (US 5881534) as

proof that chain scissioning inherently causes embrittlement. Ahlqvist et al. teaches that chain scissioning results in embrittlement of the polymer (column 4, lines 27-43) therefore the examiner maintains the rejection that chain scissioning the polymer will result in embrittlement.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 4-6, 8-9, 11-15 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hitchcock et al. (US 4452374) in view of Kremkau (US 4044187).

Hitchcock et al. teaches a process for manufacturing draw-redraw food and beverage cans using a laminate or extrusion coated steel sheet having an irradiated multilayered synthetic thermoplastic resin coating, which is composed of a ethylene polymer (polyolefin). Hitchcock et al. teaches that the polymer can be irradiated with an electron beam at any time in the process of making the can (i.e. before or subsequent to the application of to the steel substrate or after the formation of the can body) (column 6, lines 28-36).

Hitchcock et al. does not teach scissioning polymer chains by irradiating the coating with electron beam to improve resistance to “feathering” and “angel hair” formation where the irradiating is carried out as a sufficient energy and for a sufficient time to embrittle the polymer in the coating as required by **claims 1, and 19-20**.

Kremkau discloses a method for increasing bond strength, seal strength, and dimensional stability of film laminates by irradiating a polyolefin using an electron beam dosage of about 2- 20 megarads, forming a laminate, and then irradiating the entire laminate using an additional dosage between 2- 20 megarads (column 1, lines 6-9; column 3, lines 11-13 and abstract). Kremkau teaches that the laminates made using this process showed “superior” resistance to delamination and exhibits good dimensional stability under abusive conditions (column 4, lines 8-11). The laminates formed using this method are good for food products (column 4, lines 2 –6). Irradiating the crosslinked layer with a second radiation of 2-20 megarads will inherently result in the scissioning of polymer chains because the in the specification the application states that applying additional radiation of 2-20 megarads to an already crosslinked polymer will result in chain scissioning. Since irradiating the already crosslinked polymer will result in chain scissioning, the chain scissioning inherently results in an increase in embrittlement because the applicant states in the specification that “one effect of chain scissioning is an increase in the brittleness of the polymer” and that the embrittlement provides a reduction in angel hair and feathering.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of Hitchcock et al. to include the step of irradiating the already crosslinked polymer as taught by Kremkau in order to increase its resistance to delamination. One would have been motivated to do so because Hitchcock et al. teaches a process using a polyolefin coating and irradiating the polymer to increase its resistance to delamination and Kremkau teaches how performing the second irradiation after laminating increases bond strength which prevents delamination therefore one would have a reasonable expectation of success in forming the draw-redraw can with "superior" resistance to delamination.

Hitchcock et al. further teaches that the can is formed using a steel sheet (abstract) as required by **claim 2**. The polyolefin can be a propylene-ethylene copolymer (column 3, lines 31-45) as required by **claim 4**. The Hitchcock et al. teaches the polymer can be maleic anhydride (column 3, lines 61-63) as required by **claim 6**. The polymer coating can be applied to the steel using extrusion coating or laminating (column 1, lines 10-14) as required by **claim 8**.

As stated above, Kremkau teaches that the irradiation dosage is 2 – 20 megarads as required by **claim 9**. As stated above the polymer is fully cured before the irradiating step as required by **claim 11**. The composite is shaped into a container (Fig. 2) as required by **claim 12**. Kremkau teaches irradiating after the shape is formed to

improve seal and bond strength as required by **claim 14**. A conversion coating is applied before applying the coating to the metal (abstract, Hitchcock et al.) as required by **claim 15**.

5. Claims 1, 4-9, 16 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohtusuki et al. (US 4308084) in view of Kremkau (US 4044187).

Ohtusuki et al. teaches a process for preparing laminate for packaging foodstuff, which consists of laminating an aluminum substrate to at least one polyolefin film. The polyolefin are subjected to various chemical and physical treatments, or to ultraviolet irradiation, electron beams or the like to improve its adhesiveness to other materials (column 2, lines 1-6).

Ohtusuki et al. does not teach using electron beam irradiation to scission the polymer chains to improve resistance to feathering and angel hair formation where the irradiating is carried out as a sufficient energy and for a sufficient time to embrittle the polymer in the coating as required by **claims 1, 16, and 19-20**.

Kremkau discloses a method for increasing bond strength, seal strength, and dimensional stability of film laminates by irradiating a polyolefin using an electron beam dosage of about 2- 20 megarads, forming a laminate, and then irradiating the entire laminate using an additional dosage between 2- 20 megarads (column 1, lines 6-9;

Art Unit: 1762

column 3, lines 11-13 and abstract). Kremkau teaches that the laminates made using this process showed “superior” resistance to delamination and exhibits good dimensional stability under abusive conditions (column 4, lines 8-11). The laminates formed using this method are good for food products (column 4, lines 2 –6). Irradiating the crosslinked layer with a second radiation of 2-20 megarads will inherently result in the scissioning of polymer chains because the in the specification the application states that applying additional radiation of 2-20 megarads to an already crosslinked polymer will result in chain scissioning. Since irradiating the already crosslinked polymer will result in chain scissioning, the chain scissioning inherently results in an increase in embrittlement because the applicant states in the specification that “one effect of chain scissioning is an increase in the brittleness of the polymer” and that the embrittlement provides a reduction in angel hair and feathering.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of Ohtusuki et al. to include the steps of irradiating polymer before and after the laminating process taught by Kremkau in order to increase its resistance to delamination. One would have been motivated to do so because Ohtusuki et al. teaches a process using a polyolefin coating for use in packaging foodstuff that has resistance to deterioration or delamination without imparting deleterious substances to the packaged food (column 2, lines 50-55) and Kremkau teaches how performing the second irradiation after laminating increases bond

Art Unit: 1762

strength which prevents delamination therefore one would have a reasonable expectation of success in forming the food packaging laminate with “superior” resistance to delamination.

The polyolefin used in this process can be polyethylene, polypropylene, ethylene-propylene, copolymers and polybutene and maleic anhydride (abstract) as required by **claims 4 and 6**. In regards to **claim 5**, the applicant requires up to 50 mole percent of a co-monomer, this limitation includes 0 % therefore this claim is met by the prior art. The maleic anhydride is used in the amount of 0.01 – 30 parts by weight (column 5, lines 54-56) as required by **claim 7**. The polymer is applied to the metal substrate using heat rolls or an extruder (column 9, lines 10-16) as required by **claim 8**.

As mentioned above, Kremkau teaches the polymer is irradiated with 2 – 20 megarads as required by **claim 9**.

6. Claims 1-9, 16 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heyes et al. (US 5582319) in view of Kremkau (US 4044187).

Heyes et al. teaches a process where a can end is formed from a metal sheet and a thermoplastic polyester film (abstract).

Heyes does not teach scissioning the polymer chains by irradiating using electron beam to improve resistance to feathering and angel hair formation where the irradiating is carried out as a sufficient energy and for a sufficient time to embrittle the polymer in the coating as required by **claims 1, 16 and 19-20**.

Kremkau discloses a method for increasing bond strength, seal strength, and dimensional stability of film laminates by irradiating a polyolefin using an electron beam dosage of about 2- 20 megarads, forming a laminate, and then irradiating the entire laminate using an additional dosage between 2- 20 megarads (column 1, lines 6-9; column 3, lines 11-13 and abstract). Kremkau teaches that the laminates made using this process showed "superior" resistance to delamination and exhibits good dimensional stability under abusive conditions (column 4, lines 8-11). The laminates formed using this method are good for food products (column 4, lines 2 –6). Irradiating the crosslinked layer with a second radiation of 2-20 megarads will inherently result in the scissioning of polymer chains because the in the specification the application states that applying additional radiation of 2-20 megarads to an already crosslinked polymer will result in chain scissioning. Since irradiating the already crosslinked polymer will result in chain scissioning, the chain scissioning inherently results in an increase in embrittlement because the applicant states in the specification that "one effect of chain scissioning is an increase in the brittleness of the polymer" and that the embrittlement provides a reduction in angel hair and feathering.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of Heyes et al. to include the step of irradiating polymer before and after the laminating process taught by Kremkau in order to increase its resistance to delamination. One would have been motivated to do so because Heyes et al. teaches a process using a metal sheet laminated with a polyolefin to form a can end and Kremkau teaches how performing the two irradiation increases bond strength which prevents delamination therefore one would have a reasonable expectation of success in forming the can end with "superior" resistance to delamination.

Heyes et al. discloses that the metal sheets can be an aluminum alloy (abstract) such as AA3004 or AA5182 (column 1, lines 64-67 and column 3, lines 1-12) as required by **claims 2 and 3**. The metal sheet can be coated with a copolyester or a maleic anhydride graft modified polyolefin such as polypropylene (column 4, lines 60-65) as required by **claim 4 and 6**. In regards to **claim 5**, the applicant requires up to 50 mole percent of a co-monomer, this limitation includes 0 % therefore this claim is met by the prior art. The maleic anhydride is about 0.2 – 0.5% (column 5, lines 10-12) as required by **claim 7**. The metal can be roll coated or extrusion coated (column 4, lines 63-65) as require by **claim 8**.

As mentioned above the irradiation is performed using a dosage of about 2-20 megarads as required by **claim 9**.

Allowable Subject Matter

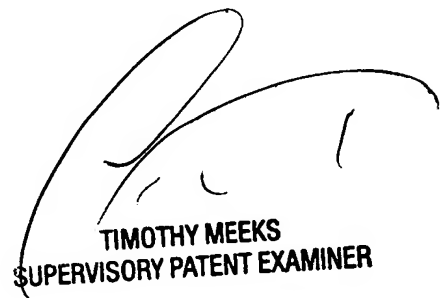
7. Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not teach or suggest forming a metal-polymer composite used for shaping into food and beverage container end panels and container bodies by applying to a metal sheet a coating having a fully polymerized polymer selected from polyolefins, anhydride-modified polyolefins, epoxies, and phenoxies, scissioning the polymer chains with an electron beam where the irradiation is carried out at a sufficient energy for a sufficient time to embrittle the polymer in the coating to improve resistance of the coating to feathering and angel hair formation prior to shaping the composite into a container body or container end panel.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cachet I. Sellman whose telephone number is 571-272-0691. The examiner can normally be reached on Monday through Friday, 7:00 - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Cachet I Sellman
Examiner
Art Unit 1762



TIMOTHY MEEKS
SUPERVISORY PATENT EXAMINER